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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,749	04/05/2001	Kevin Gary Tapperson	AUS920010054US1	8847
7590	08/13/2004		EXAMINER	ALI, SYED J
Duke W. Yee Carstens, Yee & Cahoon, LLP P.O. Box 802334 Dallas, TX 75380			ART UNIT	PAPER NUMBER
			2127	

DATE MAILED: 08/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/826,749	TAPPERSO, KEVIN GARY
Examiner	Art Unit	
Syed J Ali	2127	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 05 April 2001.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-21 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 July 2001 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date July 20, 2001.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Claims 1-21 are pending in this application.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1, 9-11, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwazaki (USPN 5,642,507) in view of Brodsky et al. (USPN 5,960,199).**

4. As per claim 1, Iwazaki teaches the invention as claimed, including a method for generating a full thread dump at a server virtual machine, comprising:

receiving a server dump request from a client virtual machine (col. 1 lines 25-42; col. 3 lines 39-46; col. 3 line 65 - col. 4 line 10; col. 4 lines 44-64);

invoking a task to issue a dump request (col. 3 lines 33-43; col. 5 lines 43-49);

generating a dump in response to the dump request (col. 4 lines 44-64; col. 5 lines 43-49);

and

passing the dump to the client virtual machine (col. 4 line 65 - col. 5 line 7; col. 5 lines 50-62).

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5. It is noted that Iwazaki does not specifically state that the virtual machine dumps are “thread dumps”. However, as it is well known that virtual machines are commonly used to run Java applications, which make heavy use of threads, it would have been obvious to one of ordinary skill in the art to indicate that the dumps are “thread dumps”. Furthermore, Brodsky teaches a method of monitoring an object-oriented system, and providing an ongoing trace of an object’s execution, which is similar to a “thread dump” (col. 3 line 52 - col. 4 line 29). As threads are implemented within object-oriented interfaces, Brodsky thus shows how a “thread dump” could be returned at any point during an object’s execution. Thus, it would have been obvious to one of ordinary skill in the art to combine Iwazaki and Brodsky to arrive at a method of generating a “thread dump” upon request by a client virtual machine since Brodsky provides a debugging interface that would be immensely useful in monitoring and correcting errors in a virtual machine. The method of Iwazaki suffers the drawback of being able to collect information during an error condition, but does not provide means for correcting the problem on the fly. Brodsky provides such an interface that allows debugging during execution (Abstract). Hereinafter, this discussion forms the basis for how Brodsky makes up for the deficiencies of Iwazaki, particularly that Iwazaki does not contemplate threads specifically, or that Iwazaki does not contemplate a debugger.

6. As per claim 9, Iwazaki teaches the invention as claimed, including a method for generating a server virtual machine full thread dump at a remote virtual machine, comprising:  
sending a server thread dump request to the server virtual machine (col. 1 lines 25-42; col. 3 lines 39-46; col. 3 line 65 - col. 4 line 10; col. 4 lines 44-64); and

receiving a thread dump from the server virtual machine (col. 4 line 44 - col. 5 line 7; col. 5 lines 43-62).

7. Brodsky teaches the invention as claimed, including the following limitations not shown by Iwazaki:

presenting the thread dump (Abstract, col. 3 line 52 - col. 4 line 29).

8. As per claim 10, Brodsky teaches the invention as claimed, including the method of claim 9, further comprising:

debugging the server virtual machine at the remote virtual machine using the thread dump (col. 3 lines 52-60).

9. As per claim 11, Iwazaki teaches the invention as claimed, including an apparatus for generating a thread dump at a server virtual machine, comprising:

receipt means for receiving a server dump request from a client virtual machine (col. 1 lines 25-42; col. 3 lines 39-46; col. 3 line 65 - col. 4 line 10; col. 4 lines 44-64);

invocation means for invoking a task to issue a dump request (col. 3 lines 33-43; col. 5 lines 43-49);

generation means for generating a dump in response to the dump request (col. 4 lines 44-64; col. 5 lines 43-49); and

communication means for passing the dump to the client virtual machine (col. 4 line 65 - col. 5 line 7; col. 5 lines 50-62).

10. The issue regarding Iwazaki's failure to specifically mention "thread dumps" is discussed above in reference to paragraph 5.

11. As per claim 19, Iwazaki teaches the invention as claimed, including an apparatus for generating a server virtual machine thread dump at a remote virtual machine, comprising:

sending means for sending a server thread dump request to the server virtual machine (col. 1 lines 25-42; col. 3 lines 39-46; col. 3 line 65 - col. 4 line 10; col. 4 lines 44-64); and  
receipt means for receiving a thread dump from the server virtual machine (col. 4 line 44 - col. 5 line 7; col. 5 lines 43-62).

12. Brodsky teaches the invention as claimed, including the following limitations not shown by Iwazaki:

presentation means for presenting the thread dump at the remote virtual machine (Abstract, col. 3 line 52 - col. 4 line 29).

13. As per claim 20, Iwazaki teaches the invention as claimed, including a computer program product, in a computer readable medium, for generating a full thread dump at a server virtual machine, comprising:

instructions for receiving a server dump request from a client virtual machine (col. 1 lines 25-42; col. 3 lines 39-46; col. 3 line 65 - col. 4 line 10; col. 4 lines 44-64);  
instructions for invoking a task to issue a dump request (col. 3 lines 33-43; col. 5 lines 43-49);

instructions for generating a dump in response to the dump request (col. 4 lines 44-64; col. 5 lines 43-49); and

instructions for passing the dump to the client virtual machine (col. 4 line 65 - col. 5 line 7; col. 5 lines 50-62).

14. The issue regarding Iwazaki's failure to specifically mention "thread dumps" is discussed above in reference to paragraph 5.

15. As per claim 21, Iwazaki teaches the invention as claimed, including a computer program product, in a computer readable medium, for generating a server virtual machine full thread dump at a remote virtual machine, comprising:

instructions for sending a server thread dump request to the server virtual machine (col. 1 lines 25-42; col. 3 lines 39-46; col. 3 line 65 - col. 4 line 10; col. 4 lines 44-64); and

instructions for receiving a thread dump from the server virtual machine (col. 4 line 44 - col. 5 line 7; col. 5 lines 43-62).

16. Brodsky teaches the invention as claimed, including the following limitations not shown by Iwazaki:

instructions for presenting the thread dump (Abstract, col. 3 line 52 - col. 4 line 29).

17. **Claims 2, 8, 12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwazaki in view of Brodsky in view of Xia (USPN 6,542,900).**

18. As per claim 2, Xia teaches the invention as claimed, including the method of claim 1, wherein the step of receiving a server dump request comprises receiving the server dump request using remote method invocation protocol (col. 4 line 66 - col. 5 line 5; col. 5 lines 48-65).

19. It would have been obvious to one of ordinary skill in the art to combine Iwazaki and Brodsky with Xia since using a standardized callback mechanism, such as RMI simplifies implementation by allowing all code to be written in a single language, thereby allowing easier debugging to identify common errors such as memory leaks (Xia, col. 44 line 66 - col. 5 line 5).

20. As per claim 8, Xia teaches the invention as claimed, including the method of claim 1, wherein the step of passing the thread dump to the client virtual machine comprises sending the thread dump using remote method invocation protocol (col. 4 line 66 - col. 5 line 5; col. 5 lines 48-65).

21. As per claim 12, Xia teaches the invention as claimed, including the apparatus of claim 11, wherein the receipt means comprises means for receiving the server dump request using remote method invocation protocol (col. 4 line 66 - col. 5 line 5; col. 5 lines 48-65).

22. As per claim 18, Xia teaches the invention as claimed, including the apparatus of claim 11, wherein the communication means comprises means for sending the full thread dump using remote method invocation protocol (col. 4 line 66 - col. 5 line 5; col. 5 lines 48-65).

23. **Claims 3-6 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwazaki in view of Brodsky in view of “JNI FAQ for JDK 1.1” (hereinafter JNI).**

24. As per claim 3, JNI teaches the invention as claimed, including the method of claim 1, wherein the step of passing the full thread dump to the client virtual machine comprises:

capturing the thread dump using a hook (Question 4, “Why does JNI\_CreateJava VM fail...”); and

passing the captured thread dump to the server task (Question 4, “Why does JNI\_CreateJava VM fail...”).

25. It would have been obvious to one of ordinary skill in the art to combine Iwazaki and Brodsky with JNI since the “vfprintf” hook allows the virtual machine to monitor itself and capture VM error messages. The output is redirected to a standard output file, which in the case of an error message, is “stderr”. This allows a user to view the application during execution and debug accordingly.

26. As per claim 4, JNI teaches the invention as claimed, including the method of claim 3, wherein the hook is vfprintf (Question 4, “Why does JNI\_CreateJava VM fail...”).

27. As per claim 5, JNI teaches the invention as claimed, including the method of claim 3, wherein the step of capturing the thread dump using a hook comprises reading the captured thread dump from a standard file handle for error messages (Question 4, “Why does JNI\_CreateJava VM fail...”).

28. As per claim 6, JNI teaches the invention as claimed, including the method of claim 3, wherein the standard file handle for error messages is stderr (Question 4, “Why does JNI\_CreateJava VM fail...”).

29. As per claim 13, JNI teaches the invention as claimed, including the apparatus of claim 11, wherein the communication means comprises:

capture means for capturing the thread dump using a hook (Question 4, “Why does JNI\_CreateJava VM fail...”); and

passing means for passing the captured thread dump to the server task (Question 4, “Why does JNI\_CreateJava VM fail...”).

30. As per claim 14, JNI teaches the invention as claimed, including the apparatus of claim 13, wherein the hook is vfprintf (Question 4, “Why does JNI\_CreateJava VM fail...”).

31. As per claim 15, JNI teaches the invention as claimed, including the apparatus of claim 13, wherein the capture means comprises means for reading the captured thread dump from a standard file handle for error messages (Question 4, “Why does JNI\_CreateJava VM fail...”).

32. As per claim 16, JNI teaches the invention as claimed, including the apparatus of claim 13, wherein the standard file handle for error messages is stderr (Question 4, “Why does JNI\_CreateJava VM fail...”).

33. **Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwazaki in view of Brodsky in view of JNI in view of Xia.**

34. As per claim 7, Xia teaches the invention as claimed, including the method of claim 3, wherein the step of passing the thread dump to the client virtual machine further comprises:

sending the thread dump from the server task to the client virtual machine using remote method invocation protocol (col. 4 line 66 - col. 5 line 5; col. 5 lines 48-65).

35. It would have been obvious to one of ordinary skill in the art to combine Iwazaki, Brodsky, and JNI with Xia since using a standardized callback mechanism, such as RMI simplifies implementation by allowing all code to be written in a single language, thereby allowing easier debugging to identify common errors such as memory leaks (Xia, col. 44 line 66 - col. 5 line 5).

36. As per claim 17, Xia teaches the invention as claimed, including the apparatus of claim 13, wherein the passing means further comprises:

means for sending the thread dump from the server task to the client virtual machine using remote method invocation protocol (col. 4 line 66 - col. 5 line 5; col. 5 lines 48-65).

### ***Conclusion***

37. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Laffra et al. (USPN 5,832,270) teaches the use of hooks to provide a visual interface to monitor the execution of an object-oriented application for the purpose of debugging the application.

Johnston et al. (USPN 6,189,142) teaches a visual framework for analyzing the performance of an executing program.

Shmid et al. (USPN 6,530,078) teaches a dump command for use in IBM S/390 computer systems running an OS/390 operating system with at least two virtual machines.

Arnold et al. (USPN 6,694,507) teaches a framework for analyzing the performance of an executing object-oriented program.

“ILE RPG for AS/400 Programmers Guide” teaches the use of a DUMP operation within source code for the purpose of analyzing and debugging code.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Syed Ali*

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July 28, 2004

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